The Effects of Income Volatility on Medical Deprivation

by

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Abstract

This study examines how income volatility in households affects their level of medical deprivation. Using SIPP data from 2002-2003, the study compares the relationship between medical hardship of households and measures of income volatility, such as the variation of average income, and the largest monthly negative income shock, over a period of 12 months. The study also examines the interaction between medical deprivation and the percent of months in which household members had no health insurance. Using a logistic regression model, this study shows that income volatility as well as household members having no health insurance affect the predicted probability of medical deprivation. Gaining a stronger understanding of the interaction between income fluctuations and material hardships, including medical deprivation, will allow policy makers to better understand influences on the well-being of low-income families.

Introduction

In the U.S. poverty has traditionally been defined by measures of income, such as household income and the federal poverty level. There is a growing body of research that shows that income-based measurements of poverty are proving to be insufficient at measuring the well-being of low-income households. These researchers maintain that income-based measures are unreliable means of identifying whether or not families are meeting their basic needs (Mayer & Jencks, 1989; Beverly, 2001; Ouellete, et al., 2004, among others).

Measures of material hardship, which identify households that do not consume minimal levels of basic goods and services such as food, housing, and medical care, provide important information about the well-being of households. Researchers have increasingly used measures of material hardship in the context of welfare reform, as these measures seem to have more correlation with true economic hardship of families (Mayer and Jencks, 1989; Beverly, 2001; and Ouellete, 2004).

In one of the first studies of material hardship (Mayer and Jencks, 1989) the researchers created an index of hardships reported by Chicago residents that included food insufficiency, lack of health insurance, unmet medical needs, housing problems, and inability to pay rent or utilities. Since then, several studies have used measures of material hardship to study the well-being of low-income households, but there is no consensus of the definition and measurement of material need (Ouellete, 2004).

Major welfare reform in the past decade has negatively affected low-income families' abilities to access cash assistance and Food Stamp benefits, among other things. According to Bania and Leete (2007) income volatility in low-income households

increased, most likely due to these policy changes. While the connection between income and food insufficiency, one of the primary material hardships, has been well studied, few have studied the affects of income volatility on food insufficiency. In addition, even less is known about the relationship between income volatility and other types of hardships, such as medical deprivation.

This study extends the previous literature by directly testing whether income volatility in households plays a role in determining their level of medical deprivation. The study compares the relationship between medical hardship of households and measures of income volatility, such as the variation of average income, and the largest monthly negative income shock over a period of 12 months. The study also examines the interaction between medical deprivation and the percent of months that at least one household member had no health insurance, and all household members had no health insurance.

BACKGROUND

Some researchers argue that the American public is more concerned with meeting a basic set of necessities rather than providing a basic level of income (Mayer and Jencks 1989; Rector 1998). The federal poverty threshold, however, is measured by income level rather than the ability to meet basic needs. Families may be meeting their needs with lower income, or families with higher income may not be meeting their needs. Studies show that individuals are more likely to be productive in society when their basic food, shelter, clothing, and medical needs are met (Beverly 2001a; Bauman 2002).

According to Boushey and Gundersen (2001), much has been made of the success of recent welfare reform due to declining caseloads and relatively high employment rates

among welfare leavers. However, their research indicates that former welfare leavers experience relatively high rates of hardship, which indicate that American families are not meeting their basic needs. Many people would assume that families who cannot meet their basic needs should be considered having poverty status.

In the U.S., federal poverty status is measured solely by a family's income and does not account for other ways in which families may obtain good and services, such as savings or assets, debt, and access to credit. This means that the federal poverty status assumes that income alone determines whether or not families can meet their basic needs. However, households may be meeting their basic needs in alternative ways such as receiving free services and/or public goods, public assistance, gifts, or help from and/or living with family or friends. Similarly, households with the same income level may experience different living standards for non income-related reasons. Beverly (2001b) points out that the official federal poverty measure does not adjust for work-related expenses such as income and payroll taxes, childcare, transportation, etc. In these ways, measures based on income could potentially misrepresent families' ability to meet their basic needs. (Mayer and Jencks, 1989; 1991; Rector et al., 1999; Ouellete et al., 2004).

At an aggregate level, several studies of poverty in the U.S. have demonstrated the lack of association between measures of material hardship and income. (e.g. Mayer and Jencks, 1989; 1991; Rector et al., 1999; Beverly, 2001B; Boushey and Gundersen, 2001). Recent research suggests that material hardship measures can supplement income poverty measures by providing detailed information about the well-being of families in the U.S. (Iceland and Bauman, 2007; Short, 2005; Ouellete et al., 2004; Cancian and

Meyers, 2004; Beverly, 2001a; 2001b; Rector et al., 1999; Mayer and Jencks, 1989; 1991, among others)

Mayer and Jencks (1989) first noted the important differences between material hardship and poverty. Testing the correlation between income poverty and material hardship using data from The Chicago Survey from 1983 and 1985, they found that a family's income explained only about 14 percent of the variation in material hardship.

Using data from the New York Social Indicator Survey, Meyers et al. (2003, as cited in Cancian and Meyers, 2004) find substantial hardship even among those who are not poor by the official poverty measure.

Research by Beverly (2001a, 2001b) proposes the use of material hardship measures to accurately measure a family's actual deprivation or hardship. She contends that hardship measures acknowledge that families can have substantially different costs of living and out-of-pocket healthcare and childcare expenses. These measures should reflect basic standards of consumption of food, housing, utilities, medical care, clothing, and consumer durables, as all of these hardships are associated with negative outcomes for individuals.

More and more researchers are creating unified indices to measure the material hardships (or deprivation) of families. Most commonly the indices are created around three basic needs: food, shelter and medical care. Several indexes also include indicators of household access to basic utilities such as electricity, gas, and telephone. (Mayer and Jencks, 1989; Beverly, 2001; Bauman, 2002; Ouellete et al., 2004). By studying how different aspects of material well-being relate to income-based poverty measures, researchers hope to gain a better understanding of this issue. (Iceland and Bauman, 2007)

But this research is preliminary, and the question remains whether it is valid to treat them in a unified way (Ouellette et al., 2004).

Iceland and Bauman (2004) examine the relationship between poverty and self-reported experiences of material hardship using the 1996 Survey of Income and Program Participation (SIPP). They find that some measures of material well-being are more strongly associated with poverty, such as food insecurity, difficulty paying bills, and possession of consumer durables, while others are less associated with poverty, such as housing and neighborhood problems and fear of crime. They conclude that various measures of well-being should not be looked at as a whole from a policy or conceptual perspective; rather each measure should be treated and measured uniquely.

Measuring hardship is difficult and there is no official governmental measure or consensus of the definition or measurement of material hardship. Research of non-income poverty measures in the U.S., such as hardships or assets, is limited and often appears in the literature as a means to argue against the official poverty measure as a way to indentify people in need. (Short, 2005)

Researchers have typically examined the general categories of food hardship, shelter hardship, and medical hardship. Some have also considered having no access to a telephone as a measure of hardship. (Cancian and Meyer, 2004) Researchers have also measured different constructs (e.g., housing quality, hunger, food insecurity, clothing in wintertime). There has been little research on the validity of specific measures and how they compare to more traditional economic measures of income and poverty. (Ouellete et al., 2004)

In addition, hardship measures do not reveal how people obtain basic goods and services and therefore exclude poor individuals who avoid hardships in alternative ways, such as by living with friends or relatives, receiving gifts/handouts, begging, stealing, or incurring debt. (Beverly, 2001a; 2001b; Cancian and Meyer, 2004; Ouellete et al., 2004)

Another challenge surrounding hardship measures is that there is no nationally representative survey that regularly collects data on multiple forms of hardship, although the SIPP collects most of the material hardship data in portions of the survey panels. (Ouellete et al., 2004)

Finally, hardship measures are vulnerable to criticisms because they do not identify the cause of the hardship. Because of personal preferences, people may choose to not consume specific goods or services that others may consider necessities. This could cause the measure to overestimate the actual hardship that is experienced. (Ouellete et al., 2004; Beverly 2001a; 2001b)

According to Bania and Leete (2007), major welfare reform in the past decade has negatively affected low-income families' abilities to access cash assistance and Food Stamp benefits, among other things. Income volatility in low-income households increased, most likely due to these policy changes. Cash assistance declined while the receipt of Food Stamps and WIC drastically increased. While several studies have examined the relationship between income level and material hardships, very few researchers have considered the role of income *volatility* in predicting material hardships. Bania and Leete (2007) do just this by testing the relationship between income volatility, income shocks and food insufficiency (the most studied material hardship). Using logistic

regression models, their study finds that the level of income, income volatility and negative income shocks all affect the predicted probability of food insufficiency.

Following Bania and Leete's model, one would expect that income volatility and negative income shocks would affect the predicted probability of medical deprivation, another key hardship identified by researchers. One could assume that greater income volatility would create more hardship for families to meet basic needs. Greater income volatility means that these households might have more difficulty in planning for expenses, as future income is unknown. Second, greater income volatility could mean that these households are more likely to face competing hardships. For example, a family with income that largely fluctuates (especially families with lower average income) may have to choose between buying enough food for the family in one month or seeking medical care for an illness or injury. Perhaps a family with children would be more likely to keep enough food in the house to avoid hunger, while a single person household might choose to seek medical care and go hungry. Finally, households with greater income volatility could represent recent reforms of welfare. According to Bania and Leete (2007) cash assistance programs that represented relatively stable income were drastically reduced and were replaced by potentially less stable earnings from employment. These households may be used to more stable income and this adjustment to more volatile income patterns could be very difficult for the household to adjust and lead to more hardships, such as not getting medical care when needed.

For more liquidity-constrained households, using home ownership and poverty status [income in relation to the federal poverty threshold] as proxies for liquidity constraint, Bania and Leete find a greater predictability of food insufficiency. The

assumption is that home owners are more likely to have access to savings, assets, and/or credit (secure debt), so non home owners are more likely to face constraints with higher income volatility or large negative income shocks. Also, households with income below 200% of the poverty level are more likely to face similar constraints as they are not likely to have access to savings, assets, and/or secure debt (credit). These households that are more likely to face liquidity constraints are younger, more female, less white, have less education and are more likely to be single parents.

Extending the work of Bania and Leete (2007), this study directly tests whether income volatility in households plays a role in determining their level of medical deprivation (one of the less studied material hardships). This study compares the relationship between medical hardship of households and measures of income volatility, such as the CV variation of monthly income, and the largest monthly negative income shock, over a period of 12 months. Also examined is the interaction between medical deprivation and the percent of months that at least one household member had no health insurance, and all household members had no health insurance. Finally, the study compares medical deprivation in relation to households that are likely to be liquidity constrained, using home ownership and poverty status as proxies.

In sum, this study builds on the growing research concerning the relationship between income volatility and material hardships, specifically medical deprivation. Gaining a stronger understanding of the interaction between income and material hardships and deprivation will help develop a better understanding how income fluctuations (in addition to income levels) affect deprivation. In turn, this will have implications for policies that relate to income stability, such as welfare-related reforms.

METHODOLOGY

Data

There are two national surveys that ask questions about family hardships as well as welfare use — the Survey of Income and Program Participation (SIPP) and the National Survey of American Families (NSAF). These surveys ask families questions about whether they "go without" and experience material deprivation. (Boushey and Gundersen, 2001) Many researchers who have developed material hardship indexes have used data from the Survey of Income and Program Participation (SIPP), of the U.S. Census Bureau. The SIPP is a longitudinal survey that uses a nationally representative stratified sample of U.S. households to collect a wide variety of economic and demographic information on panels of respondents over a period of a few years, contacting sample members every four months [called "waves"].

This study uses SIPP data from the 2001 panel, specifically from waves 6, 7, and 8, which include data from 2002-2003. The data set for this study consists of one record per non-elderly (age 18-60) household head in the panel and yields a sample of 18,579 households for analysis.

The methods used here roughly follow Bania and Leete's (2007) study of income volatility and food insufficiency. First, this study examines the overall characteristics of the survey sample. Using univariate analysis, income characteristics, health insurance characteristics, householder characteristics (age, gender, race/ethnicity, education, marital status), and household characteristics (number of adults and children, homeownership, employment, disability, elderly) are analyzed (Table 1). The characteristics used here are consistent with Bania and Leete's study.

This study then uses multivariate logistic regression models to examine the effects of income volatility and health insurance on the dependent variable while controlling for the effects of independent variables such as race/ethnicity, age, education, marital status, number of adults and children, home ownership, employment status, disability status, and seniors in the household. According to Bania and Leete (2007) economic theory predicts that the impact of income volatility and income shocks should vary with the degree of liquidity constraint faced by a household. Due to limitations of the SIPP survey, there are no direct measures of such limitations. However, following Bania and Leete (2007), this study experiments with two proxies: lack of home ownership, or annual household income falling below 200% of the poverty level. Therefore, the multivariate logistic regression models compare coefficients of non home owners, home owners, and households with income below 200% of poverty, to the overall sample (Tables 2-8).

Variables

The central focus of this study is to measure medical deprivation, income volatility, health insurance coverage in the household, and a range of household head and household characteristics.

The dependent variable in this study is a binary indicator of medical deprivation. The variable 'No_doctor_or_dentist' is derived from SIPP survey question AW50_NEED6 (In the past 12 months was there a time you needed to see a doctor or go to the hospital but did not go?) and SIPP survey question AW53_NEED7 (In the past 12 months was there a time you needed to see a dentist but did not go?). The medical deprivation questions were asked at the end of the time period covered by wave 8, referring to the 12 months covered by waves 6, 7 and 8. The income variables cover those

same 12 months; other point in time variables refer to month 12. This is consistent with many of the material hardship studies that include a medical need indicator, in which they use a measure similar to that included in the 1996 SIPP to describe whether a household has access to needed medical care: 'Whether there was a time when anyone in the household needed to see a doctor or go to the hospital but did not go.' (Ouellette et al., 2004)

In order to measure income volatility, two independent variables are used in this study. The variable 'CVvariable' calculates income volatility over the past 12 months by taking the coefficient of variation (the standard deviation divided by the mean) over the past 12 months of actual household income. The variable 'MaxShock' calculates the largest monthly negative income shock by first comparing the average household monthly income with each of the 12 months of actual household income, then eliminating positive shocks, and finally calculating the largest negative shock of the 12 months. The study controls for average monthly income.

While examining medical deprivation among households in relation to income volatility and shocks, this study controls for health insurance coverage. This is based on the logical assumption that households in which members are uninsured for longer periods of time would have higher medical deprivation, and households in which members are uninsured for shorter periods of time would have lower medical deprivation. Household members that have health insurance, including Medicaid, Medicare, and private insurance, are more likely to go to the doctor, dentist, and/or hospital when necessary. For members with no health insurance, unknown (and most likely high) medical costs are likely to be a barrier for seeking medical care when needed.

To measure health insurance coverage in the household, two independent variables were created to experiment between at least one member having no health insurance and all members having no health insurance. 'PrctMos_noins' calculates the percentage of the 12 months in which at least one household member had no health insurance. 'PrctMos_allnoins' calculates the percentage of the 12 months in which all household members had no health insurance (including single-member households).

Other controls in this study include householder characteristics (age, gender, race/ethnicity, education, marital/family status) and household characteristics (number of adults, number of children, home ownership, number of household members employed, disabled, and elderly).

RESULTS

In Table 1 the means and standard deviations are provided for all variables that are included in our estimated models for the sample of 18,579 for whom all variables are defined and for the subsamples that we alternately designate as potentially representing liquidity constrained and not liquidity constrained households – those who are and are not homeowners and those with incomes below 200 percent of the poverty threshold. All statistical calculations are made using population weights.

Mean monthly household income is $4,918; 54 percent of householders are male; 42 percent had at least a college degree; 63 percent lived in homes owned by a member of the household and 33 percent of householders lived with a spouse and their own children. Of these households, 12 percent report having medical deprivation at least once in a 12 month period. An average household has one or more members lacking health insurance for about four months out of the year.

Characteristics of the subsamples are as might be expected: household heads from households that are more likely to be liquidity constrained [not home owners or below 200% of poverty] are younger, more female, less white, have less education and are more likely to be single parents. They are also less likely to contain one or more employed persons and are more likely to have a member who is disabled. These households also have more income volatility, and have household members with no health insurance a higher percentage of time.

All models shown here include a full complement of control variables including demographic characteristics, home ownership, education, and household composition.

Table 2 shows the first model including the CV variable (income fluctuation over 12 months) and the insurance variable that includes households in which at least one household member has no insurance coverage. Coefficients of the control variables are as expected, with home owners being less likely to be deprived and disabled households being more likely to be deprived. Households with more adults are less likely to be deprived.

Table 3 repeats the model in Table 2 along with three variants. Model 1 uses the CV variable and the insurance variable that includes households in which at least one household member has no insurance coverage. Model 2 uses the same insurance variable as Model 1 but looks at the largest negative monthly income shock rather than overall income fluctuation. In Model 3, the CV variable is used as well as the insurance variable in which all household members have no insurance coverage. Model 4 uses the same insurance variable as Model 3, but includes the largest negative monthly income shock variable instead of the income deviation variable.

In all cases, the coefficient for average income is negative, meaning that the lower the average income, the higher the medical deprivation. The coefficient on the CV of monthly income (Models 1 and 3) is positive. This shows that the greater the fluctuation of income around the mean the higher the medical deprivation. The coefficient for the largest negative monthly income shock [largest negative deviation from average income] is negative, which means that the greater the negative shock [the more negative the shock], the higher the medical deprivation. The coefficients on income volatility, health insurance, and control variables are quite stable across these four models and all are statistically significant at the .05 level or higher.

Looking at medical deprivation in relation to income volatility and negative income shocks, it is logical to assume that households with liquidity constraints would show higher medical deprivation. While not a perfect proxy variable, greater liquidity constraint is approximated by home ownership. We assume that non home owners have fewer savings, fewer assets, and more limited access to credit resources. In order to evaluate these differences, analyses by different subsets of the sample broken down by home ownership are shown in Table 4.

While one might expect that income volatility would be more likely to have negative effects for households not owning their own homes, this effect is not as apparent as one might expect. The effect of the CV variables is diminished for non-homeowners compared to homeowners, although the effect of the negative shock variables is about the same for the two groups. One possible explanation is that the presence or absence of health insurance in a household is a strong predictor of medical deprivation but is also highly correlated with income volatility for liquidity-constrained households. We then

might expect income volatility to be an important predictor of medical deprivation in the absence of controls for health insurance. We test this in Table 5 using the CV variable and find that this is the case. When health insurance controls are left out of the equation, the coefficient on the CV of monthly income is positive and statistically significant for non-homeowners as well as for homeowners. However, the size of the coefficient is still smaller for non-homeowners than others.

Table 6 does a similar comparison as Table 5, except that the negative income shock variable is used instead of the CV variable. The effect of negative income shocks is statistically significant for both non home owners and home owners when controlling for health insurance. When we remove health insurance controls from the model, the coefficients increase slightly for each group. As the model predicts, and contrary to income volatility (CV variable) negative income shocks have a more significant effect on non home owners than home owners, whether or not we control for health insurance.

I conduct a similar analysis using poverty level as a proxy for possible liquidity constraints. In Table 7, I show logistic regression models using the CV variable and with and without the insurance variable, comparing households below 200% of the federal poverty threshold to the whole sample. As was the case with non-homeowners, we can see that among poor households the income deviation measure becomes moderately significant (at the .10 level) only after removing the insurance variable. In addition, the effect of income volatility continues to be smaller for poor households than for the whole sample, similar to non home owners.

Table 8 does a similar comparison as Table 5, except that we are comparing households of poverty to the entire sample rather than looking at home ownership. The

negative income shock variable is used, and we compare models that control for health insurance with models that do not control for health insurance. The effect of negative income shocks is not statistically significant for households below 200% of the federal poverty threshold when controlling for health insurance. When we remove health insurance controls from the model, negative income shocks become a predictor of medical hardship for households of poverty. Similar to the effect of income volatility, the effect of negative income shocks continues to be smaller for poor households than for the whole sample.

Taking all these results together, they suggest that income volatility and negative income shocks are determinants of medical deprivation. Both income volatility and negative income shocks appear to be important for higher income households, but seem to be secondary to the presence of health insurance for households below 200% poverty. While negative income shocks are important for both non home owners and home owners, income volatility appears secondary to the presence of health insurance for non home owners. The results suggest that income volatility, negative income shocks, and the presence of health insurance all play important roles in determining medical deprivation.

DISCUSSION AND POLICY IMPLICATIONS

This study demonstrates that income volatility and negative monthly income shocks do have a statistically significant effect on the probability of medical deprivation among non-elderly U.S. households. Households with higher income volatility [deviation from average income] have higher probability of medical deprivation. Also, households with greater negative monthly income shocks [largest negative deviation from average income] have higher probability of medical deprivation.

Models of the relationship between income volatility and other kinds of deprivation (Bania and Leete, 2007) suggest a more pronounced effect for both income volatility and negative income shocks for those who are not home owners, which is one group that is more likely to face liquidity constraints. The results show that negative income shocks are an important predictor for medical deprivation for non home owners. However, the effects of the income volatility are diminished for non home owners compared to home owners. After removing health insurance variables from the income volatility model, income volatility becomes an important predictor of medical deprivation in these households. However, the effect of income volatility is still smaller for non home owners than others. This suggests that the negative income shocks have a profound effect for non home owners in predicting medical deprivation, while income volatility does not.

Models (Bania and Leete, 2007) have also suggested that we would observe a stronger relationship between the income volatility and negative income shock variables and medical deprivation in households below 200% of the federal poverty threshold, as this is another group that is more likely to face liquidity constraints. Different from non home owners, negative income shocks are only an important predictor for medical deprivation for households of poverty after removing the health insurance variables. Again, the effect of income volatility becomes moderately significant (at the .10 level), similar to non home owners only after removing the health insurance variables. The effect of income volatility continues to be smaller for poor households than for the whole sample.

These results suggest that income volatility does not have a significant effect for liquidity constrained households in predicting medical deprivation as long as access to

health insurance is controlled for. One possible explanation for the diminished effect of income volatility in households of poverty and non home owners could be related to age. Household heads of non home owning households are an average of six years younger than home owners, and household heads of poor households are an average of three years younger than higher income households. One could assume that younger people may not need to visit the doctor, dentist, and/or hospital as often as older people, and therefore would report lower medical deprivation.

In summary, both income volatility and negative monthly income shocks do have a statistically significant effect on the probability of medical deprivation among non-elderly U.S. households. The effect of the income volatility variable (CV[monthly income, months 1-12]) is diminished for households with expected liquidity constraints, such as non home owners and households below 200% of the federal poverty threshold. However, the effect of the negative shock variable is about the same for both liquidity constrained and non liquidity constrained households. Income volatility appears to be important for higher income households as a predictor for medical deprivation, but appears to be secondary to the presence of health insurance.

Limitations of this study include the lack of measure of current (liquid) assets and lack of a definitive indicator for the degree of liquidity constraint faced by a household.

Some will argue that the SIPP medical hardship indicators are too subjective to be useful and do not indicate why households did not receive medical care (Ouellette et al., 2004; Beverly, 2001b). According to Beverly (2001a, 2001b), it is relatively clear from the context of the survey that this question refers to medical need caused by the inability

to finance medical care. However, Beverly suggests ways SIPP could be improved for more accurate data (2001b, p.145):

> Because SIPP collects hardship data at the household level, these indicators refer to household experiences. All individuals living in households whose head reported that his or her household experienced a particular hardship are assumed to have experienced this hardship. For eviction, utility disconnection, and telephone disconnection, this approach seems ideal. However, some, but not all, household members may have experienced food insufficiency and medical need.

Also, this study created one dichotomous variable to measure if at least one person in the household needed to but did not go to a doctor, dentist, or hospital. In the past 12 months. However, there are weaknesses with this variable. For example, people who do not have dental insurance may not get regular cleanings if they cannot afford it, but they would if they had insurance or they could afford the cleaning. If they answered yes to the survey question, they would be reported as having medical deprivation.

This study and the SIPP survey do not measure the severity of the medical deprivation. If a household member avoided stitches, a checkup for possible flu, a dental cleaning, or a root canal, all of it is considered medical deprivation in this study. More complete data sources that included medical information on each household member, including the severity of medical deprivation, and more investigation into this area would be very helpful in learning more about this type of hardship.

Future studies of medical deprivation could include more analysis of income volatility-related variables to give us a better understanding of the effects of income patterns on medical deprivation. A more ideal study would analyze data regarding short-term and long-term income patterns by household member, status of household members

by month (e.g., employment, public assistance, income, education, race/ethnicity, etc.), and more complete information about the reasons for the hardships. Once this data is analyzed it could provide much more insight into the usefulness of measures of material hardship and poverty measurement in general.

Another possible study would survey U.S. households to determine how Americans understand and define "basic needs." Ouellette et al. (2004) question what the minimum standards or thresholds are for basic needs, and whether the goal should be to develop one consistent approach to measuring material hardship, or if different approaches should be developed and adopted for different population groups.

According to Beverly (2001b) an estimated 24 million Americans experienced some form of hardship in 1995. These hardships occurred despite food stamp benefits, public health insurance, housing subsidies, utility assistance, the EITC, and despite cash and in-kind support from charitable organizations, family members, and friends. Boushey and Gundersen (2001) warn that, based on evidence of hardships in U.S. households, work alone is not enough to ensure that families are meeting their basic needs. In the wake of recent welfare reform policies the trend is growing towards more "in-kind" benefits and services relative to cash transfers.

This study shows that medical deprivation, one key measure of hardship, depends not only on income level but also on negative income shocks and income volatility. Income smoothing programs, such as cash assistance programs, would reduce the negative effects of negative income shocks and income volatility. The reduction of such programs in recent years makes these results concerning for the well-being of U.S. families. The U.S. government could create more income smoothing programs to

complete with private quick cash programs, pay-day loans, and other high-interest, non-secured debt programs that are readily available and do not contribute to the long-term well-being of U.S. families. In addition, more government programs that target specific hardships would likely reduce instances of these hardships and increase the well-being of families. For example, just as Food Stamps and WIC have reduced food insufficiency (Bania and Leete, 2007) universal health care would likely have a profound impact in reducing medical deprivation.

Measures of material hardship are a potential useful tool in policy analysis, program evaluation, and an important measurement of the well-being of U.S. families. This study suggests that policymakers should pay close attention to the implications of policy for the fluctuation in income and not just the level of income for families reporting hardships.

REFERENCES

Acs, G. and Loprest, P., with Roberts, T. (2001). *Final synthesis report of the findings from ASPE's "Leavers" grants.* Report to the U.S. Department of Health and Human Services. Washington, D.C.: Urban Institute. Retrieved from http://www.urban.org/ publications/410809.html.

Bania, N. and Leete, L. (2007). *Income volatility and food insufficiency in U.S. low-income households, 1992-2003.* Institute for Research on Poverty, Discussion Paper no. 1325-07. Retrieved from http://www.irp.wisc.edu/initiatives/funding/ usdasgp/abstracts05.htm.

Bauman, K. (2002). Welfare, Work, and Material Hardship in Single Parent and Other Households. *Journal of Poverty, (6)*1: 21-40.

Beverly, S. (2001a). Measures of Material Hardship: Rationale and Recommendations. *Journal of Poverty, 5*(1), 23-41.

Beverly, S. (2001b). Material Hardship in the United States: Evidence from the Survey of Income and Program Participation. *Social Work Research, 25*(3), 143-151.

Boushey, H. and Gundersen, B. (2001). *When work just isn't enough: Measuring hardship faced by families after moving from welfare to work.* Briefing Paper. Washington, D.C.: Economic Policy Institute. Retrieved from http://www.epi.org/ content.cfm/briefingpapers_hardships

Cancian, M. and Meyer, D. (2004). Alternative Measures of Economic Success Among TANF Participants: Avoiding Poverty, Hardship, and Dependence on Public Assistance. *Journal of Policy Analysis and Management, 23*(3): 531-548.

Heflin, C. (2006). *Dynamics of material hardship in the Women's Employment study.* Institute for Research on Poverty, Discussion Paper no. 1315-06. Retrieved from http://www.irp.wisc.edu/publications/dps/dplist2006.htm.

Iceland, J. and Bauman, K.J. (2007). Income Poverty and Material Hardship: How Strong is the Association? *Journal of Socio-Economics, 36*(3), 376-396.

Mayer, S.E. and Jencks, C. (1989). Poverty and the Distribution of Material Hardship. *Journal of Human Resources, 24*(1), 88-114.

Mayer, S.E. and Jencks, C. (1991). Recent Trends in Economic Inequality in the United States: Income vs. Expenditures vs. Material Well-Being. *Wilson Quarterly, (15)*4, 138.

Ouellete, T., Burstein, N., Long, D., and Beecroft, E. (2004). *Measures of Material Hardship.* Final Report. U.S. Department of Health and Human Services. Office of the Assistant Secretary for Planning and Evaluation. Washington, D.C. Retrieved from http://aspe.hhs.gov/hsp/ material-hardship04/.

Rector, R., Johnson, K.A., Youssef, S.E. (1999). The Extent of Material Hardship and Poverty in the United States. *Review of Social Economy, 57*(3), 351-387.

Sen, A. (1999). *Development as freedom*. Anchor Books, New York.

Short, K. (2005). Material and Financial Hardship and Income-Based Poverty Measures in the USA. *Journal of Social Policy, 34*(1), 21-38.

Table 1. Sample Characteristics, 2001 SIPP Panel

	Whole Sample		Not Home Owners		Home Owners		Below 200% of Poverty	
Variable	**Mean**	**SD**	**Mean**	**SD**	**Mean**	**SD**	**Mean**	**SD**
Medical Deprivation	12.00%	32.00%	17.00%	38.00%	8.00%	27.60%	22.00%	41.30%
Average Monthly Income (months 1-12)	$4,918	$4,234	$3,142	$2,774	$5,938	$4,577	$1,568	$955
CV(Monthly Income, months 1-12)	0.33	0.33	0.39	0.40	0.29	0.28	0.47	0.49
Max Negative Shock	-16.46	21.87	-243.09	15.96	-384.16	24.30	-47.96	6.09
% months with one hh member with no insurance	31.1%	39.9%	43.9%	42.2%	23.8%	36.5%	53.2%	42.4%
% months with all hh members with no insurance	9.2%	25.1%	16.8%	32.2%	5.1%	18.9%	18.8%	33.5%
Householder Characteristics								
Age (years)	41.0	10.4	36.9	10.7	43.4	9.3	38.8	10.6
Percent Male	54.0%	49.9%	47.0%	49.9%	57.0%	49.5%	42.0%	49.3%
Percent Black (non-Hispanic)	12.0%	32.8%	19.0%	39.5%	9.0%	27.4%	21.0%	40.9%
Percent Hispanic	12.0%	32.7%	18.0%	38.6%	9.0%	28.2%	21.0%	40.9%
Percent Other (non-Hispanic)	5.0%	21.0%	6.0%	22.9%	4.0%	19.8%	5.0%	21.0%
Percent High School Graduate	27.0%	44.5%	29.0%	45.4%	26.0%	43.9%	34.0%	47.4%
Percent Some College	33.0%	46.8%	33.0%	47.0%	32.0%	46.8%	29.0%	45.4%
Percent Married with Children	33.0%	47.1%	19.0%	39.6%	41.0%	49.2%	32.0%	46.6%
Percent Single Parent with Children	14.0%	34.9%	24.0%	42.4%	9.0%	28.4%	31.0%	46.1%
Household Characteristics								
Number of Adults	1.93	0.84	1.66	0.80	2.08	0.82	1.76	0.84
Number of Children	0.91	1.18	0.83	1.19	0.95	1.18	1.40	1.44
Percent Home Ownership	63.0%	48.2%					39.0%	48.8%
Percent with Employed Person	91.0%	28.6%	84.0%	36.4%	95.0%	22.1%	74.0%	43.9%
Percent with Disabled Person	15.0%	35.3%	18.0%	38.3%	13.0%	33.3%	27.0%	44.4%
Percent with Elderly Person	2.0%	15.5%	2.0%	13.0%	3.0%	16.7%	2.0%	15.1%
N	18, 579		6,689		11,755		4,741	

Table 2. Logistic Regressions Explaining Medical Deprivation
(standard errors in parenthesis)

Variable	Model 1
Intercept	-1.994 ***
	(0.152)
Income Components	
Average monthly income, months 1-12	-0.016 ***
(in 100's of dollars)	(0.001)
CV(Monthly Income, months 1-12)	0.125 **
(in 100's of dollars)	(0.063)
Insurance Components	
At least one household member with no insurance coverage	1.204 ***
(in % of months)	(0.064)
Controls	
Age (years)	0.006
	(0.003)
Percent Male	-0.202 ***
	(0.051)
Percent Black (non-Hispanic)	-0.237 ***
	(0.073)
Percent Hispanic	-0.197 ***
	(0.074)
Percent Other (non-Hispanic)	-0.376 ***
	(0.131)
Percent High School Graduate	0.075
	(0.070)
Percent Some College	0.313 ***
	(0.060)
Percent College Graduate	-0.041
	(0.063)
Percent Married with Children	0.124
	(0.090)
Percent Single Parent with Children	-.062
	(0.091)

(continued on next page)

*** Significant at the .01 level
** Significant at the .05 level
* Significant at the .10 level

Table 2. Continued

Variable	Model 1	
Number of Adults	-.110	***
	(0.038)	
Number of Children	.043	
	(0.032)	
Percent Home Ownership	-.327	***
	(0.056)	
Percent with Employed Person	.025	
	(0.080)	
Percent with Disabled Person	.742	***
	(0.064)	
Percent with Elderly Person	-.035	
	(0.164)	
Unweighted sample size	18,579	
C[a]	0.079	

*** Significant at the .01 level
** Significant at the .05 level
* Significant at the .10 level

[a] Cox and Snell R Square

Table 3. Logistic Regressions Explaining Medical Deprivation
(standard errors in parenthesis)

Variable	Model 1	Model 2	Model 3	Model 4
Intercept	-1.994 ***	-1.933 ***	-2.001 ***	-1.923 ***
	(0.152)	(0.141)	(0.163)	(0.153)
Income Components				
Average monthly income, months 1-12 (in 100's of dollars)	-0.016 ***	-0.021 ***	-0.018 ***	-0.024 ***
(in 100's of dollars)	(0.001)	(0.002)	(0.001)	(0.002)
CV(Monthly Income, months 1-12)	0.125 **		0.190 **	
(in 100's of dollars)	(0.063)		(0.068)	
Largest negative monthy income shock		-0.012 ***		-0.016 ***
(in 100's of dollars)		(0.002)		(0.002)
Insurance Components				
At least one household member with no insurance coverage	1.204 ***	1.169 ***		
(in % of months)	(0.064)	(0.064)		
All household members with no insurance coverage			1.148 ***	1.113 ***
(in % of months)			(0.086)	(0.084)
Unweighted sample size	18,579	18,579	18,579	18,579
C[a]	0.079	0.081	0.071	0.074

*** Significant at the .01 level
** Significant at the .05 level
* Significant at the .10 level

[a] Cox and Snell R Square

Table 4. Logistic Regressions Explaining Medical Deprivation by Home Ownership
(standard errors in parenthesis)

	Not Home Owners				Home Owners			
Variable	**Model 1**	**Model 2**	**Model 3**	**Model 4**	**Model 1**	**Model 2**	**Model 3**	**Model 4**
Intercept	-2.003 ***	-1.991 ***	-2.115 ***	-2.053 ***	-2.248 ***	-2.095 ***	-2.097 ***	-1.999 ***
	(0.193)	(0.178)	(0.208)	(0.194)	(0.261)	(0.248)	(0.277)	(0.265)
Income Components								
Average monthly income, months 1-12	-0.014 ***	-0.020 ***	-0.015 ***	-0.025 ***	-0.016 ***	-0.021 ***	-0.018 ***	-0.023 ***
(in 100's of dollars)	(0.002)	(0.003)	(0.002)	(0.003)	(0.002)		(0.002)	(0.002)
CV(Monthly Income, months 1-12)	0.059		0.164 *		0.266 ***		0.265 **	
(in 100's of dollars)	(0.081)		(0.088)		(0.103)		(0.110)	
Largest negative monthy income shock		-0.014 ***		-0.020 ***		-0.011 ***		-0.013 ***
(in 100's of dollars)		(0.004)		(0.004)		(0.003)		(0.003)
Insurance Components								
At least one household member with no insurance coverage	1.144 ***	1.095 ***			1.221 ***	1.207 ***		
(in % of months)	(0.089)	(0.088)			(0.094)	(0.093)		
All household members with no insurance coverage			0.899 ***	0.865 ***			1.523 ***	1.472 ***
(in % of months)			(0.111)	(0.109)			(0.136)	(0.133)
Unweighted sample size	6,672	6,743	5,759	5,803	11,753	11,788	10,680	10,709
C[a]	0.067	0.070	0.056	0.061	0.063	0.064	0.058	0.060

*** Significant at the .01 level
** Significant at the .05 level
* Significant at the .10 level

[a] Cox and Snell R Square

Table 5. Logistic Regressions Explaining Medical Deprivation by Home Ownership, with and without Insurance Variables, using CV Income Variable (standard errors in parenthesis)

	Not Home Owners		Home Owners	
Variable	**With Insurance Variable**	**Without Insurance Variable**	**With Insurance Variable**	**Without Insurance Variable**
Intercept	-2.003 ***	-1.721 ***	-2.248 ***	-1.785 ***
	(0.193)	(0.189)	(0.261)	(0.256)
Income Components				
Average monthly income, months 1-12	-0.014 ***	-0.019 ***	-0.016 ***	-0.021 ***
(in 100's of dollars)	(0.002)	(0.002)	(0.002)	(0.002)
CV(Monthly Income, months 1-12)	0.059	0.221 ***	0.266 ***	0.411 ***
(in 100's of dollars)	(0.081)	(0.077)	(0.103)	(0.100)
Insurance Components				
At least one household member with no insurance coverage	1.144 ***		1.221 ***	
(in % of months)	(0.089)		(0.094)	
Unweighted sample size	6,672	6,672	11,788	11,753
C[a]	0.067	0.043	0.056	0.050

*** Significant at the .01 level
** Significant at the .05 level
* Significant at the .10 level

[a] Cox and Snell R Square

Table 6. Logistic Regressions Explaining Medical Deprivation by Home Ownership, with and without Insurance Variables, using Largest Negative Monthly Income Shock Variable (standard errors in parenthesis)

	Not Home Owners		Home Owners	
Variable	**With Insurance Variable**	**Without Insurance Variable**	**With Insurance Variable**	**Without Insurance Variable**
Intercept	-1.991 ***	-1.598 ***	-2.095 ***	-1.529 ***
	(0.178)	(0.172)	(0.248)	(0.242)
Income Components				
Average monthly income, months 1-12	-0.020 ***	-0.030 ***	-0.021 ***	-0.028 ***
(in 100's of dollars)	(0.003)	(0.003)	(0.002)	(0.002)
Largest negative monthy income shock	-0.014 ***	-0.022 ***	-0.011 ***	-0.016 ***
(in 100's of dollars)	(0.004)	(0.004)	(0.003)	(0.003)
Insurance Components				
At least one household member with no insurance coverage	1.095 ***		1.207 ***	
(in % of months)	(0.088)		(0.093)	
Unweighted sample size	6,743	6,743	11,788	11,788
C[a]	0.070	0.048	0.064	0.051

*** Significant at the .01 level
** Significant at the .05 level
* Significant at the .10 level

[a] Cox and Snell R Square

Table 7. Logistic Regressions Explaining Medical Deprivation in Households by Federal Poverty Status, with and without Insurance Variables, using CV Income Variable (standard errors in parenthesis)

	Below 200% of Poverty		Whole Sample	
Variable	**With Insurance Variable**	**Without Insurance Variable**	**With Insurance Variable**	**Without Insurance Variable**
Intercept	-1.748 ***	-1.433 ***	-1.994 ***	-1.609 ***
	(0.218)	(0.213)	(0.152)	(0.148)
Income Components				
Average monthly income, months 1-12	-0.001	-0.007	-0.016 ***	-0.021 ***
(in 100's of dollars)	(0.006)	(0.006)	(0.001)	(0.001)
CV(Monthly Income, months 1-12)	0.023	0.126 *	0.125 **	0.285 ***
(in 100's of dollars)	(0.079)	(0.076)	(0.063)	(0.061)
Insurance Components				
At least one household member with no insurance coverage	1.062 ***		1.204 ***	
(in % of months)	(0.096)		(0.064)	
Unweighted sample size	4,911	4,911	18,425	18,425
C[a]	0.048	0.022	0.079	0.061

*** Significant at the .01 level
** Significant at the .05 level
* Significant at the .10 level

[a] Cox and Snell R Square

Table 8. Logistic Regressions Explaining Medical Deprivation in Households by Federal Poverty Status, with and without Insurance Variables, using Largest Negative Monthly Income Shock Variable (standard errors in parenthesis)

	Below 200% of Poverty		Whole Sample	
Variable	**With Insurance Variable**	**Without Insurance Variable**	**With Insurance Variable**	**Without Insurance Variable**
Intercept	-1.703 ***	-1.278 ***	-1.933 ***	-1.432 ***
	(0.200)	(0.194)	(0.141)	(0.136)
Income Components				
Average monthly income, months 1-12	-0.003	-0.015 **	-0.021 ***	-0.029 ***
(in 100's of dollars)	(0.006)	(0.006)	(0.002)	(0.002)
Largest negative monthy income shock	-0.004	-0.012 *	-0.012 ***	-0.018 ***
(in 100's of dollars)	(0.007)	(0.007)	(0.002)	(0.002)
Insurance Components				
At least one household member with no insurance coverage	1.052 ***		1.169 ***	
(in % of months)	(0.095)		(0.064)	
Unweighted sample size	4,998	4,998	18,531	18,531
C[a]	0.049	0.023	0.081	0.064

*** Significant at the .01 level
** Significant at the .05 level
* Significant at the .10 level

[a] Cox and Snell R Square